ABSTRACT

Methods for producing porous tricalcium phosphate net-shaped material are provide. The methods involve preparing a reactant mixture comprising calcium oxide and phosphorus pentoxide in a mole percent ratio that allows the mixture to form tricalcium phosphate upon combustion thereof, forming this mixture into a desired final shape in a die with compression, and carrying out a combustion synthesis therewith. Net-shaped TCP materials of the combustion synthesis, comprising alpha tricalcium phosphate or mixtures of alpha and beta tricalcium phosphate, are optionally further treated to effect transition of the alpha phase to the beta phase. The net-shaped TCP materials can have a uniform or non-uniform porosity.